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Date: March 29, 2006

Subject: Freedom Place – Drainage Modification Request
SPEX05-LE-008 PIN: 6889-89-6214, 6889-18-3742, 6899-05-7716
REZN05-LE-001

This review letter addresses only the material set forth in the Drainage Modification Request and is provided as a supplement to the March 17, 2006 Engineering Review memorandum and by no means replaces or obviates the information presented therein. The Engineering Department has reviewed the above referenced modification request and offers the following for Planning Commission consideration of this subject as it relates to this project application.

Fauquier County Ordinance Requirements

The Fauquier County Subdivision Ordinance Section 9-13(B) (2) requires that adverse environmental impact of the development be minimal. Specific criteria for determination identifies that lack of adequate drainage and/or excessive environmental impact with respect to drainage shall be deemed to exist if surface or subsurface water retention and/or runoff is such that it constitutes a danger to the structural security of proposed dwelling units or other on-site structures. In addition, inadequate drainage shall be deemed to exist where proposed site grading and development creates harmful or damaging effects from erosion and siltation on downhill and/or downstream land and no adequate remedy is provided.

The Fauquier County Subdivision Ordinance Section 9-13(B) (3) further requires that adverse environmental impact of the development should be minimal. Specific criteria identified to mitigate against this situation requires that the layout and design if the development to be designed so as to provide a quality environment for residents by minimizing its adverse impact. The general considerations for minimal impact require road and street layout to utilize existing topography so that unnecessary cuts and fills are avoided.

The Fauquier County Design Standards Manual (DSM) Section 203.2 requires that the final construction plan stormwater management design follow the generalized design information established with the concept plan that is approved through the PC and BOS.

The DSM defines the term "Channel" as a natural or artificial watercourse with a definite bed and banks that conducts continuously or periodically flowing water.

DSM Section 201.8.2 requires that the natural drainage/channel characteristics and drainage divides to be preserved to the maximum extent practicable. Drainage analyses shall be considered within each drainage area.

DSM Section 201.8.6 establishes criteria for all stormwater conveyance practices to be designed to convey stormwater to allow for the maximum removal of pollutants and reduction in velocities. To achieve this, a design may include but not be limited to maximizing flow paths from inflow points to outflow points.

DSM Section 201.8.9 requires that proposed or natural drainage ways not occur across or upon individual lots unless prior approval has been obtained from the program administrator. Further, this section states that proposed lot lines shall observe natural drainage ways to the maximum extent practicable.

Purpose and Intent of County DSM and DSM Requirements

The BOS initiated the development of the DSM to supplement and solidify the Zoning and Subdivision Ordinances of Fauquier County and to update and replace the Fauquier County Stormwater Management Ordinance. The DSM represents an effort to provide clarification of certain Zoning and Subdivision requirements as well as set forth standards for design that when applied to a plan, will render a plan that is generally prepared in approvable format. Chapter 2 of the DSM addresses the issue of Stormwater Management.

A Concept SWM Plan must accompany all projects that are required to undergo SE, RZ, or PP review. This plan, once approved through PC and BOS, sets in motion a final design effort that must observe the initial assumptions, layout, design calculations, and schematic development patterns that were represented in the Concept SWM Plan. The intent of the concept plan is to advance a project through PC and BOS approval that can reasonably be fine-tuned to meet specific ordinance requirements during final construction plan review.

The preservation of natural drainage ways and/or their associated channel characteristics facilitates the re-introduction of stormwater runoff back into larger receiving drainage ways in similar fashion as had been established by nature without overstressing these points of re-introduction. It also provides for a drainage corridor, otherwise known as overland relief corridors, which will accommodate runoff amounts that exceed the design capacity of storm sewer collection systems. By law, these collection systems are only required to accommodate storm events of 2-, and 10- year magnitude, after which the systems become over capacity causing the runoff to spill towards the overland relief

corridors. Further, it allows for groundwater infiltration that is critical to the recharge of sub-surface aquifers.

The preservation of naturally occurring drainage divides allows for stormwater to be collected, treated and discharged in similar quantities and recurrence potential that occurs naturally. By performing drainage analyses within each representative drainage area across the site, a SWM Design is capable of maintaining the balance of the overall environmental system.

By requiring all stormwater conveyance practices to be designed to convey stormwater to allow for the maximum removal of pollutants and reduction in velocities, the DSM achieves the exact intent of what is stated. Further by achieving this through a design that includes a maximization of flow paths from inflow points to outflow points, an increased potential for groundwater recharge is realized.

By restricting proposed or natural drainage ways from occurring across or upon individual lots, surface and/or groundwater is conveyed through areas that do not affect improvements on an individual owners lot, nor does it preclude the lot owner from utilizing their property in a manner otherwise permitted through local ordinances or HOA documents. (i.e. - construction of decks, pools. patios, fences, sheds, playgrounds, etc.)

By requiring proposed lot lines to observe natural drainage ways, it is impossible for a home to be constructed on the lot that will be affected by the existence of natural drainage features, thus limiting the potential for the home to flood by underground water and/or surface water sources.

Summary of Findings on the Basis of the Modification Request

Applicants Request:
The Modification request desires to limit the applicability of DSM 201.8.2 to have only Bowens Run and its tributary stream recognized as the only natural drainage way/channel associated with the site.
AND
The Modification request desires to limit the applicability DSM 201.8.9 regarding natural drainage across or upon individual lots so as to avoid the elimination or relocation of residential lots subject to this rezoning.

Applicants Justifications and Engineering Division Findings:
#1 Justification - includes a claim that no County Ordinance defines "natural drainage/channel". This is accompanied by numerous references to legal findings, one concluding that the general rule of statutory construction is to infer the legislature's intent from the plain meaning of the language used and another concluding that the context may be examined by considering the other language used in the statute.
#1 Finding – The DSM definition of "Channel" is provided above, it does not discriminate against natural or manmade. The intent of the Ordinance has likewise been discussed

above. By examining other language used in the statute, the context of what would be covered is reasonably inferred and has been consistently applied to all applications reviewed by the Office of the County Engineer.

#2 Justification - suggests that a definition of natural channel that occurs in the Appendix to Chapter 2 of the DSM does not apply because it is associated with a document titled Technical Bulletin #1 developed by the Virginia Department of Conservation and Recreation (DCR) as was designed to address outfalls from a developed site.
#2 Finding – The original Fauquier County Stormwater Management Ordinance (SWMO) was developed from a Model Ordinance created by DCR. Technical Bulletin #1 was also created by DCR. The SWMO and the referenced Technical Bulletin were incorporated into the DSM and adopted by the BOS as Chapter 2 of the DSM. Any definition represented in Chapter 2 of the DSM absolutely applies to the administration of stormwater criteria in Fauquier County.

#3 Justification – suggests that the natural drainage way areas identified by the County Engineering Report are wholly dependent on surface flows from the immediate area and are the result of the outfall of roadway ditches or culverts and that they do not exhibit any defined bed and bank components.
#3 Finding – Based on an investigation of the 1937 Soils Maps for Fauquier County and the 1937 Aerial Photographs for Fauquier County, the Engineering office observed that these natural drainage ways existed in 1937 and are represented by the symbol for a drainage way/stream on the 1937 soils map. This observation is further supported by distinct landscape positions reflected on the 1937 aerial photographs. The culverts that exist underneath present day roadways appear as through they were necessary to accommodate the natural drainage patterns that date back to at least 1937. County Engineering interpretation of the photograph and soil survey indicates that these areas are not wholly dependent upon surface flows from the immediate area. Conversely, in addition to surface water conveyance through these areas, there is significant groundwater breakout occurring in these areas long after rainfall events. Staff members from the Engineering Office inspected the site multiple times, flowing water was observed in the subject areas following a period of 6 weeks of no significant precipitation. During these investigations, defined bed and bank components were observed in the subject areas.

Equivalent Alternative Analysis

Of the 9 equivalent alternatives proposed by the applicant, 4 are ordinance requirements, 1 would become a preliminary plan approval condition, 1 has been confirmed by VDOT to not be an achievable design standard, and 1 is not applicable to their request. The remaining two are discussed below.

Item #1 of this section will assist with insuring that adequate overland relief will be provided and is already included in the March 17, 2006 Engineering Review memorandum as Comment # 8.

Item #7 of this section is proposed to be addressed by the applicant through an additional proffer. A minor modification to the applicants suggested language to require all lots

associated with this application (instead of limiting it to the PRD lots) and meeting the criteria set forth therein would address the concern of structures in high water table soils.

Engineering Summary and Recommendations

Based on the information provided, the Engineering Office does not find itself in a position to support the justification associated with the current drainage modification request. At present, the conceptual site layout is not reflective of one that will be capable of meeting County Ordinance and DSM requirements. It contemplates earthen fills across the site up to 15' +/-, some of these occurring directly adjacent to the Bowens Run Floodplain Limits. These fills significantly alter the topography and drainage patterns that have naturally established themselves on this site.

The Bealeton Area in general has continually been a source of homeowners' complaints and concerns that their homes flood regularly. These complaints are not solely limited to homes that were constructed many years ago, they have occurred in homes that have been occupied as recently as 1 year ago. The DSM provides the County with the appropriate tools to insure that projects do not create potentially hazardous or damaging situations from occurring that result out of insufficient accommodations for stormwater runoff and groundwater migration during the early stages of project planning.

In earlier discussions and PC work sessions, the applicant indicated that preservation of these areas could result in affecting up to 60 development lots. Based on the information provided in the current project application, it appears as though the preservation of two natural drainage ways would result in a potential impact to 15 +/- development lots. A few minor adjustments to the schematic layout and distribution of product type could result in no net effect on the total yield of development lots as wells as achieve the intent of the ordinance requirements.

In the case of the two identified natural drainage ways, both of these ultimately become less defined, similar to that of an alluvial fan, as they approach the floodplain region of Bowens Run. This indicates significant surface water absorption and aquifer recharge. There are three public wells that occur on this site which rely on the constant recharge of these groundwater resources. The alluvial fan zones on the downstream ends of the defined bed & banks of the drainage ways should not have impervious development proposed within these zones.

These two identified natural drainage ways, one on the north side of the subject site and one on the south side of the subject site should be preserved in their natural location and state. This should not be construed to preclude vegetative enhancements or expansions of these areas.

An *Influence Zone* of these natural drainage areas should be defined as the naturally occurring cross sectional area of the drainage way necessary to convey the 25-year storm event in a developed condition. Grading associated with other site improvements may be introduced into these areas such that the 100-year storm event in a developed condition may be conveyed through these areas.

A revised Concept Development Plan should be prepared that does not reflect contemplated lots within the *Influence Zone* of the natural drainage ways. Further, the concept SWM Plan should preserve these areas in their natural location and state with the exception of open-ended culverts in the areas of contemplated roadway crossings. The revised Concept should also preserve the alluvial fan zones on the downstream ends of the defined bed & banks of the natural drainage ways and should not have impervious development proposed within these zones. As more detailed site topography and as-built location surveys of these areas become available, final adjustments and refinements to the *Influence Zones* may be accommodated with more detailed plan documents and data.

It is also recommended that the applicants suggested proffer language associated with basements in high groundwater soil types be revised to require all lots meeting the criteria set forth therein that are associated with this application instead of limiting it to just the PRD lots.

The recommendations contained herein as well as those identified in the March 17, 2006 Engineering Review memorandum (as revised in the March 22, 2006 staff/applicant meeting) should be required of this project application. Minor amendments to the March 17, 2006 Engineering Review memorandum would be necessary pending the recommendations provided herein.